

well-advanced pulmonary tuberculosis there was a moderate impulse to be felt at the cricoid cartilage with the cardiac systole, and in several other patients a slight impulse existed, especially during inspiration; but in none was there a distinct downward tug, such as is found in aneurism. My own opinion of the value of the simple tracheal tug is, therefore, a high one. If investigation of the value of the tracheal diastolic shock by other writers confirms my own ideas I believe that the value of the tracheal element in the diagnosis of the aortic aneurism will be distinctly enhanced.

The crucial test of the value of the sign under discussion should be in differentiating aneurism from solid thoracic tumor in cases not involving the chest-wall. We must conclude, however, that if diastolic shock is of value—as it certainly is—in establishing the diagnosis of aneurism in case the tumor is accessible to palpation, it should be of equal value in case no palpable tumor exists, if transmitted through the vascular tumor to the trachea as in the cases quoted.

I shall await reports as to the value of this sign in such cases with the greatest interest, and hope to be able to record in future my own further conclusions.

REPORT OF A FAMILY OUTBREAK OF TRICHINOSIS.

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SINCE the trichina spiralis was first described in the United States by Bowditch and J. B. S. Jackson¹ numerous instances of both the sporadic and epidemic forms of trichinosis have been reported from various sections of the country. In reviewing and tabulating the American literature on the subject up to 1897, Packard² found that not only the largest number of cases, but also the largest number of reports had emanated from New York State. In adding another to the already lengthy list of reports from this State we would give as our excuse the occurrence of certain clinical peculiarities in the cases and the renewed interest in the disease which has recently been aroused by the publications of Osler³ on the sporadic form, and of Brown⁴ and others on the peculiar blood changes.

¹ Bowditch and J. B. S. Jackson. Boston Medical and Surgical Journal, 1842, vol. xxiv., No. 8.

² Packard. Journal of the American Medical Association, 1897, vol. xxix. p. 59.

³ Osler. THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, March, 1899.

⁴ Brown. Johns Hopkins Hospital Bulletin, April, 1897; Journal of Experimental Medicine, 1898, vol. iii., No. 3; Boston Medical and Surgical Journal, September 1, 1898; Medical News, January 7, 1899.

The epidemic which we report occurred in the city of Albany, and implicated two Italian families, numbering in all nine persons. Eight of the patients were under the care of Dr. Neuman, while the ninth was attended by Dr. Thomas A. Ryan, to whom we are indebted for permission to report the case.

The clinical histories of the cases briefly related are as follows:

CASE I.—D. V., the father of one of the families; aged fifty-four years. Was taken severely ill on February 26th after malaise and anorexia, lasting for a week. His chief complaint was of pain, severe all over the body, but excruciating at the pit of the stomach, from whence it radiated to the back, between the shoulder-blades. His bowels were constipated. He had no nausea or vomiting. When first seen the face had an anxious look, and was pale and oedematous. The hands were also oedematous, but less so than the face. The tongue was coated with a thick, brownish coat. Pulse 92, temperature 103° F., respirations 28, and shallow. The thoracic organs were normal. The abdomen was distended, with tenderness of its walls, but the abdominal organs were normal.

When seen on February 28th the general pains continued with great severity, and there was a sharp, stabbing pain in the left side of the thorax, accompanied by a hard cough, but no expectoration. Physical examination showed slight dulness over the lower lobe of the left lung and a distant to-and-fro friction rub.

March 1st The dulness persisted; it did not change on change of position. The breath-sounds were distant, the friction rub still present. The face and hands were still swollen, the latter more markedly than at the last note, and there was swelling of the legs from the calves down.

2d. The patient has some photophobia. He has been delirious at night and has been sweating profusely. Temperature 102.4° F., pulse 92, respiration 26.

4th. The patient is very weak. Five lenticular, rose colored spots were seen on the abdomen; they disappear on pressure.

5th. He has difficulty in swallowing. A few fresh spots on the abdomen.

7th. Patient has been crying all night with severe pain. Is very restless. The dulness over the left lower lobe is increased; there is slight expectoration of stringy mucus.

8th. He is markedly delirious at night. The back of the scalp is tender. The spots on the abdomen are still present. Heart-sounds are muffled. Abdominal organs not palpable. The difficulty in swallowing persists. The bowels are obstinately constipated. Pains in the epigastric region are very severe. He has numbness in the arms and legs; the swelling of the latter is more marked, and they are so sensitive that he can hardly bear the bedclothes upon them. Blood examination: Leucocytes, 19,000; eosinophiles, 40.6 per cent.

11th. He has had nausea, but no vomiting. Is sleeping better, and swallowing is improved. The pain in the right leg has been unusually severe, and it is swollen much more than the left. The pain is most severe in the region of the femoral vein. The leg looks pale, and the swelling is quite uniform.

13th. The swelling of the right leg has progressed; a distinct thick-

ening of the femoral vein can be made out. Insomnia and perspiration continue. Tenderness at insertion of muscles is marked. Blood examination: Leucocytes, 18,000.

16th. The œdema of the face is abating. The abdominal eruption has gone. The swelling of the legs is also disappearing.

19th. Blood examination: Leucocytes, 12,400; eosinophiles, 37.4 per cent. The patient is improving. There is an erythematous rash all over the trunk, in the form of irregularly circular patches from 1 to 2 cm. in diameter.

23d. He is improving slowly. Still has a sense of oppression in the pit of the stomach and colicky pain. The urine, which had previously been normal, shows a trace of albumin and a few hyaline casts. Urea, 3.5 per cent. Heart-sounds feeble; lungs normal, except for slight dulness over the left lower lobe.

26th. Blood examination: Leucocytes, 20,600; eosinophiles, 14.8 per cent.

April 1st. Blood examination: Leucocytes, 13,200; eosinophiles, 10 per cent.

2d. Slowly improving. Still has pain in the right leg and over the pit of the stomach.

May 20th. Practically convalescent. Since his convalescence, however, there is a certain rigidity of the muscles, simulating that seen in paralysis agitans, but there is no tremor present.

CASE II.—Mary C., aged twenty-four years; married daughter of D. V. Her illness began with malaise and anorexia, accompanied by a dull headache, most marked in the frontal and occipital regions. She took to bed February 16th, after these symptoms had persisted for a week. She complained of cough, with white, stringy expectoration. She was very thirsty. No nose-bleed, no diarrhœa. The bowels were constipated.

When first seen, on February 23d, the tongue was coated, except at the tip, with a whitish coat. The skin was sallow and waxy, the expression listless, mentalization slow—a picture suggesting the typhoid state. The temperature was 100.6° F., pulse 90, respiration 20. The heart-sounds were normal. The lungs showed the physical signs of bronchitis. Liver dulness slightly increased. Spleen not palpable. There was diffuse tenderness in the epigastric region, and a localized area of exquisite tenderness, the size of a twenty-five-cent piece, immediately below the ensiform cartilage. There was gurgling, but no tenderness, in the right iliac fossa. Urine showed a trace of albumin; diazo-reaction positive; urea, 3 per cent.

25th. There is œdema of the lower eyelids, extending down onto the cheeks.

28th. The œdema has extended, giving the whole face a bloated, waxy appearance. She complains of pain in the lower left chest.

March 1st. Patient had a chill this evening. Pain in the chest has increased, and is stabbing in character; she is dyspnoic. There is slight dulness over the lower left chest in front and behind, with a friction rub. Heart-sounds loud and clear.

2d. Dyspnoea continues. Pain is lessened. There is dulness over the left lower lobe, the breath-sounds being distant and faint. Heart-sounds weak and muffled. Spleen easily palpable.

5th. She complains of difficult deglutition. Diarrhœa is present. The pulse is dicrotic.

6th. Patient had six watery movements during the night. Dyspnoea is marked; it amounts to orthopnoea. A systolic murmur transmitted to the axilla can be heard at the apex.

8th. The patient complains of insomnia. She has some muscular tenderness. The ankles are slightly oedematous. She sweats a great deal. Other symptoms as before. Blood examination: Leucocytes, 8400; eosinophiles, 21.8 per cent.

12th. Blood examination: Leucocytes, 20,000; eosinophiles, 23.4 per cent.

14th. Improving; diarrhoea still present; pleurisy clearing up; mitral murmur more distinct. Apex displaced downward and to the left.

16th. Oedema of face nearly gone; ankles still oedematous; dyspnoea present on slightest exertion; patient feels weak.

19th. Blood examination: Leucocytes, 17,200; eosinophiles, 40 per cent.

26th. Blood examination: Leucocytes, 12,000; eosinophiles, 30.8 per cent.

April 1st. Blood examination: Leucocytes, 16,000; eosinophiles, 41.5 per cent.

10th. The patient is gradually gaining strength.

July 2d. Patient feels fairly well, but exertion still brings on dyspnoea. There is no muscular tenderness, and the oedema has disappeared.

CASE III.—A. V., a nephew of D. V., aged twenty-four years. This patient was attended by Dr. Ryan. He was first seen on March 2d, at which time he had a temperature of 104° F. and the physical signs of a bronchopneumonia. He had no nausea or vomiting, but a diarrhoea of moderate severity, the movements being of a pea-soup character. He had slight muscular tenderness, especially at the lower ends of both biceps muscles. The face was slightly oedematous and pale. He sweated profusely.

March 8th. Blood examination: Leucocytes, 24,000; eosinophiles, 33.3 per cent. The patient consented to have a small piece of muscle removed, and Dr. Ryan kindly excised a portion of the lower end of the left biceps. Microscopical examination showed a fair number of motile, non-encapsulated trichinae.

11th. He left the Albany Hospital, which he had entered on the 2d, and returned home, his temperature being normal. After a few days his fever returned and was present for about three weeks, the temperature being of a remittent type. He had a few spots on the abdomen simulating rose-spots. Profuse sweating was present. Cramps in the arms and legs were severe. He had persistent insomnia. He was able to get up five weeks from the second attack, much emaciated and very weak.

12th. Blood examination: Leucocytes, 14,000; eosinophiles, 36 per cent.

19th. Blood examination: Leucocytes, 20,600; eosinophiles, 27.6 per cent.

26th. Blood examination: Leucocytes, 18,000; eosinophiles, 23.25 per cent.

April 1st. Blood examination: Leucocytes, 15,200; eosinophiles, 28.6 per cent.

CASE IV.—Mrs. D. V., aged forty-nine years, wife of D. V. On March 5th the patient was seized with a severe chill, lasting from fifteen

to twenty minutes and accompanied by severe headache and general muscular pains. There was no gastro-intestinal disturbance. She was first seen March 6th. At this time she had marked dyspnoea, with some cyanosis. Temperature was 103.5° F., pulse 104, respiration 38.

Physical examination showed a consolidation of the upper lobe of the left lung, over which bronchial breathing and crepitant râles could be heard. The heart-sounds were weak, the second pulmonic being accentuated. Perspiration was profuse. Sputum frothy and mucous in character.

March 7th. Lower right lobe also shows an area of consolidation. The face is very œdematous, so much so that the eyelids can scarcely be opened. Wrists and hands swollen and tender; sputum is rusty. Temperature 104° F., pulse 109, respiration 40. The urine contains a trace of albumin, but no casts; urea, 2.9 per cent.

8th. When seen at 11 A.M. was weak and depressed. At 1.30 P.M. Dr. Neuman was called and found the patient in a collapsed condition. The pulse was small, and a profuse, clammy sweat was present. Temperature was 97.4° F., pulse 90, respiration 40. At 4 P.M. she had rallied; the skin was warm and the temperature had reached 99.2° F. This evidently was a critical fall of temperature. Blood examination: Leucocytes, 8000; eosinophiles, 33.6 per cent.

12th. Blood examination: Leucocytes, count lost; eosinophiles, 27 per cent.

16th. The patient has been gradually improving; she is up and about the house, but feels weak. States that she would be in bed, but that so many of the family are sick some one must do the housework. She still complains of pain in the epigastric region. The œdema of the face has almost disappeared.

19th. Blood examination: Leucocytes, 12,400; eosinophiles, 32.8 per cent.

26th. Blood examination: Leucocytes, 13,200; eosinophiles, 30 per cent.

CASE V.—T. V., aged twenty-six years, son of D. V. He was first seen February 23d. Had been feeling unwell for a week or ten days, with anorexia and constipation, but no nausea, vomiting, or diarrhoea. He complained of pains all over the body, chilly sensations, and photophobia. Examination showed slight tenderness of the eyeballs, but no muscular tenderness. The face and neck were very œdematous, particularly the latter, which was swollen so as to be on a line with the jaw. The thoracic organs were normal. The liver extended two finger-breadths below the margin of the ribs. The spleen was palpable; no rose-spots. Temperature 101.2° F., pulse 82.

February 26th. Patient has slight headache; abdomen tympanitic; no abdominal tenderness. A few rose-colored spots on the abdominal wall, which disappeared on pressure.

28th. The rose-colored spots are still present on the abdomen. Temperature 101.2° F.

March 2d. Abdominal eruption has gone. Temperature 100° F.

4th. The face is still very œdematous; he complains of stiffness in the arms.

6th. He complains of restlessness. The œdema of the neck is abating. Temperature 102.4° F.

8th. The patient is feeling better, but sweats a great deal. Pressure over the insertions of the muscles is painful. Blood examination: Leucocytes, 8000; eosinophiles, 50.2 per cent.

12th. Blood examination: Leucocytes, 14,000; eosinophiles, 31.8 per cent.

19th. The patient feels well, but has a waxy pallor. He is still weak, and has some pain in the arms, back, and legs; this is worse on motion; gait normal. Temperature 98° F. Blood examination: Leucocytes, 18,600; eosinophiles, 42.2 per cent.

26th. Blood examination: Leucocytes, 14,600; eosinophiles, 43 per cent.

CASE VI.—R G., aged thirty years, friend of the V. family; was first seen on March 4th. He complained of malaise, anorexia, and some dyspnoea on exertion. He had a headache, was thirsty, and could not sleep. Examination showed that his face was œdematous and had a waxy pallor. The thoracic organs were normal; the liver and spleen both palpable. Temperature 102.6° F., pulse 84.

March 6th. Condition about the same. Temperature: Morning, 102° F.; evening, 104° F.

9th. The patient feels better; the face is still œdematous. There is muscular soreness at the insertion of the pectoralis major. There is slight feeling of distress in the epigastric region. Blood examination: Leucocytes, 14,000; eosinophiles, 32.16 per cent.

11th. Has been at work, and feels fairly well. There is still some muscular tenderness. Nothing peculiar in the gait.

19th.. Blood examination: Leucocytes, 17,200; eosinophiles, 46 per cent.

26th. Blood examination: Leucocytes, 8000; eosinophiles, 35.4 per cent.

April 9th. Blood examination: Leucocytes, 6000; eosinophiles, 16.6 per cent.

CASE VII.—J. V., aged twenty-one years, son of D. V. He had been treated twice within the last two years for attacks of typhoid fever. He was first seen on February 26th, complaining of aching and stiffness in the back and legs, and thirst. Examination showed a waxy œdema of the face, particularly of the cheeks and lower eyelids. There was some swelling at the angles of the jaw. No muscular tenderness could be made out. Thoracic and abdominal organs normal. Temperature 99° F.

March 4th. The swelling of the face had nearly disappeared. The patient feels well, but looks pale.

12th. Blood examination: Leucocytes, 16,000; eosinophiles, 31 per cent.

19th. Blood examination: Leucocytes, 23,000; eosinophiles, 37 per cent.

26th. Blood examination: Leucocytes, 16,600; eosinophiles, 39.4 per cent.

April 1st. Blood examination: Leucocytes, 8600; eosinophiles, 35.6 per cent.

16th. Perfectly well. There has never been any muscular tenderness.

CASE VIII.—R. V., aged eighteen years, son of D. V. The patient was sent to Dr. Neuman's office, February 10th, on an errand for his father. Incidentally he stated that two or three weeks previously he had had pains in the back, arms, and legs, lasting for some days, and had had diarrhoea for a day or two. The pains were fleeting and

transitory in character, and were followed by some muscular stiffness. During the same period of time the patient sweated profusely at night. Physical examination was negative.

March 12th. Blood examination: Leucocytes, 10,000; eosinophiles, 35 per cent.

19th. Blood examination: Leucocytes, 14,600; eosinophiles, 50.4 per cent.

26th. Blood examination: Leucocytes, 12,600; eosinophiles, 29.75 per cent.

April 1st. Blood examination: Leucocytes, 12,600; eosinophiles, 38 per cent.

CASE IX.—Mrs. G., aged nineteen years, wife of R. G. Did not complain at all, but was questioned at the time of her husband's illness. Stated that she had slight swelling of the face for one or two days, but otherwise felt well. Physical examination was negative, except for slight tenderness over the lower ends of the biceps muscles. Pulse and temperature were normal.

March 9th. Blood examination: Leucocytes, 12,400; eosinophiles, 17 per cent.

19th. Blood examination: Leucocytes, 15,200; eosinophiles, 20 per cent.

26th. Blood examination: Leucocytes, 12,600; eosinophiles, 13.5 per cent.

April 9th. Blood examination: Leucocytes, 10,000; eosinophiles, 8 per cent.

An inquiry into the source of infection in this outbreak elicited the fact that the only article of diet which had been partaken of by all nine patients was some home-made sausage made by the V. family. A short time preceding the outbreak of the disease a member of the V. family had lunched with G. and his wife, and had shared some of his sausage with them. Examination of the sausage showed it to be mainly composed of irregularly cubical pieces of pork cut by hand, and often measuring as much as 1 centimetre in diameter. The patients stated that this sausage was twice cooked before being eaten—once at the time of manufacture, when it was submitted to the action of boiling lard, and again just before it was eaten, when it was thoroughly fried. On close questioning the fact was elicited that on rare occasions the frying was omitted, but that the sausage was never eaten without some form of cooking.

A microscopical examination of the sausage showed that many of the pieces of pork contained numerous partly encapsulated trichinæ. The pieces containing the parasite were very irregularly distributed, some sausages containing hardly any infected pork, while in others almost every piece was infected. This was explained by the fact that the meat was bought at a wholesale house, in the form of "scraps," these scraps being made up of a mixture of odds and ends of pork left over from a number of carcasses.

From a clinical stand-point, this outbreak is mainly interesting on account of the almost entire absence in most of the cases of the preliminary gastro-intestinal disturbances. Although anorexia was present, and in one or two of the severer cases severe epigastric pain, with marked tenderness, neither nausea, vomiting, nor diarrhoea occurred in most instances. In this the outbreak resembles very closely the form described by Renz,¹ early in the history of the disease, as "insidious trichinosis," a form much more common in sporadic than in epidemic cases. Another prominent symptom, either lacking or very slightly marked in most of the cases, was muscular tenderness; even when noted it had to be searched for carefully, and was not well marked in any case except Case I.

General muscular aching, however, was present as an early symptom in all cases, and its association with fever and bronchial symptoms would have led to a suspicion of la grippe, but for the œdema of the face.

The resemblance to typhoid fever, so frequently noted in other epidemics, was well illustrated in this one by the course of the fever, the apathetic condition of the patient, and the accompanying bronchitis in Cases II. and III.

The one symptom which was prominent in all the cases was the œdema of the face; it was extremely characteristic, in no case suggesting inflammatory œdema, and resembling most nearly the œdema of chronic Bright's disease, on account of the peculiar waxy color which accompanied it, although much more extensive than in this disease.

Fever was present in all but the mildest cases, usually accompanied by severe sweating, and in the severe cases insomnia, which did not yield readily to the ordinary hypnotics.

The various complications of the disease as observed in these cases, the endocarditis in Case II., the lung complications in the first four cases, the spots simulating rose-spots, and the erythema, have been observed before in epidemic and sporadic cases, both in this country and in Germany. The occurrence of a femoral thrombosis, such as occurred in Case I., seems, however, to be very unusual. In none of the cases was there noted the tenderness of the heels, with the accompanying toe-walking, as described by E. R. Hun² and Wendt.³

The great variation in the severity of the disease in the different individuals was no doubt due to the fact, already mentioned, that the sausages, being made of pork which originated from different animals, were some of them much more extensively infected than others.

The origin of this outbreak illustrates very forcibly the necessity of thorough cooking for pork; certainly, it must be very unusual for the meat to be cooked twice, as it was in this instance, and still retain

¹ Renz. Cited by Niemeyer, *Practice of Medicine*, 1877, vol. ii.

² E. R. Hun. *Transactions of the Medical Society of New York*, 1869.

³ Wendt. *THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, April, 1878.

its infectivity. That this does occur, however, was shown in the Hettstädt epidemic,¹ in which the sausage causing the infection had been both smoked and roasted.

Doubtless the large size of the pieces of pork was responsible for the fact that in our cases the cooking failed to kill the trichinæ, for the experiments of Hertwig² showed that pieces of infected pork the thickness of the thumb could be boiled for twenty-two minutes without killing the trichinæ.

The results of the blood examinations in this outbreak confirm the observations originally made on the blood in this disease by Brown,³ and subsequently confirmed by Cabot,⁴ Gwyn,⁵ Atkinson,⁶ and Stump.⁷ In Brown's original study of three cases the main changes noted in the blood were a leucocytosis, in which the increase in the leucocytes occurred in the eosinophiles, a corresponding decrease in the neutrophiles, and in some cases a decrease in the small mononuclear leucocytes at the beginning of the attack. The leucocytes varied in number in Brown's cases from 8000 to 35,000 per cubic millimetre, and the eosinophiles varied from 8 per cent. to 68 per cent. In Cabot's case a differential count showed 27 per cent. of eosinophiles. In Gwyn's case the one leucocyte count noted is 17,000, while the eosinophiles varied between 33 per cent. and 65.9 per cent. In Atkinson's case the eosinophiles reached as high as 58 per cent., and in Stump's case as high as 52 per cent.

In the cases in the outbreak here reported it will be seen from the accompanying table that a leucocytosis was present in every case, and that the differential count showed this to be due to the great increase in the number of eosinophiles. Furthermore, as already noted by Brown, there existed with the eosinophilia a corresponding decrease in the neutrophiles, and in some cases, early in the disease, a decrease in the number of small mononuclears. With regard to the eosinophilia in our cases, it was perfectly easy in most of them to make the diagnosis from the fresh blood specimen; in fact, the blood picture was extremely typical and striking. The cases reported by the above-mentioned observers, being sporadic in character and few in number, it was impossible for them to make comparisons regarding any ratio which might exist between the leucocytosis and the severity of the attack or between the eosinophilia and the severity of the attack. It can be seen from a study of our cases that the intensity of the disease did not necessarily

¹ See Keller, *THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, April, 1864, vol. lxxv.

² Hertwig. Quoted by J. D. Jackson, *THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, January, 1867.

³ Brown. *Op. cit.*

⁴ Cabot. *Boston Medical and Surgical Journal*, 1897, vol. cxxxvii. p. 676.

⁵ Gwyn. *Centralblatt f. Bakt.*, Band xxvi. No. 1.

⁶ Atkinson. *Philadelphia Med. Jour.*, June 3, 1899.

⁷ Stump. *Ibid.*, June 17, 1899.

correspond to the degree of the eosinophilia, as, for example, R. V., who had an exceedingly mild attack of the disease, showed a maximum of over 50 per cent. of eosinophiles, while the highest percentage reached by D. V., who had a severe attack, was 40.6 per cent. On the other hand, it would seem that the degree of leucocytosis did, in a general way, correspond to the severity of the attack, Cases I., II., III., and VI., relatively severe cases, having a higher and more persistent leucocytosis than the milder cases.

TABLE SHOWING THE DIFFERENTIAL COUNTS IN THE ABOVE CASES.
BLOOD FILMS FIXED BY HEAT AND STAINED WITH EHRLICH'S
TRIPLE STAIN.

Name.	Date.	No. of leucocytes.	Polynu- clears.	Transitionals and large mononuc- lears.	Small mononuc- lears.	Eosino- philes.
Case 1. D. V.	March 8	19,000	47.4 per ct.	8.8 per ct.	3.2 per ct.	40.6 per ct.
	" 13	18,000				
	" 19	12,400	50.6 "	4.4 "	7.6 "	37.4 "
	" 26	20,600	69.6 "	5.6 "	10.0 "	14.8 "
	April 1	13,200	73.0 "	5.0 "	12.0 "	10.0 "
Case 2. Mary C.	March 8	8,400	61.4 "	6.8 "	10.0 "	21.8 "
	" 12	20,000	51.6 "	10.4 "	14.6 "	23.4 "
	" 19	17,200	39.0 "	4.8 "	16.2 "	40.0 "
	" 26	12,000	45.0 "	6.6 "	14.6 "	30.8 "
	April 1	16,000	42.0 "	4.3 "	12.2 "	41.5 "
Case 3. A. V.	March 8	24,000	56.8 "	6.4 "	3.6 "	33.3 "
	" 12	14,000	52.4 "	3.8 "	7.8 "	36.0 "
	" 19	20,600	61.4 "	2.8 "	5.2 "	27.6 "
	" 26	18,000	66.25 "	4.0 "	6.5 "	23.25 "
	April 1	15,200	56.6 "	4.4 "	10.4 "	28.6 "
Case 4. Mrs. D. V.	March 8	8,000	51.0 "	7.8 "	7.6 "	33.6 "
	" 12	-----	50.8 "	4.2 "	18.0 "	27.0 "
	" 19	12,400	50.6 "	5.6 "	11.0 "	32.8 "
	" 26	13,200	54.0 "	5.0 "	11.0 "	30.0 "
Case 5. T. V.	March 8	8,000	32.6 "	10.8 "	6.4 "	50.2 "
	" 12	14,000	49.0 "	4.2 "	15.0 "	31.8 "
	" 19	18,600	41.4 "	5.6 "	10.8 "	42.2 "
	" 26	14,600	35.0 "	3.5 "	18.5 "	43.0 "
Case 6. R. G.	March 9	14,000	45.6 "	15.16 "	7.0 "	32.16 "
	" 19	17,200	45.4 "	2.6 "	6.0 "	46.0 "
	" 26	8,000	48.8 "	5.0 "	10.8 "	35.4 "
	April 9	6,000	64.4 "	6.8 "	12.2 "	16.6 "
Case 7. J. V.	Mar. 12	16,000	44.0 "	9.2 "	15.8 "	31.0 "
	" 19	23,000	53.2 "	2.8 "	6.2 "	37.0 "
	" 26	16,600	41.6 "	6.0 "	13.0 "	39.4 "
	April 1	8,600	39.3 "	9.0 "	16.1 "	35.6 "
Case 8. R. V.	Mar. 12	10,000	39.0 "	6.0 "	20.0 "	35.0 "
	" 19	14,600	36.0 "	4.8 "	8.5 "	50.4 "
	" 26	12,600	55.5 "	5.5 "	9.25 "	29.75 "
	April 1	12,600	44.0 "	7.0 "	5.5 "	38.0 "
Case 9. Mrs. R. G.	Mar. 9	12,400	48.0 "	9.6 "	25.4 "	17.0 "
	" 19	15,200	59.2 "	4.0 "	16.8 "	20.0 "
	" 26	12,600	67.0 "	6.5 "	13.0 "	13.5 "
	April 9	10,000	74.0 "	5.0 "	13.0 "	8.0 "

With regard to the origin of the eosinophiles in these cases, we can only say that we were unable to observe any evidence in the blood itself

of a transformation of neutrophiles into eosinophiles. We were unable to procure a sufficient quantity of muscle to confirm or refute Brown's observation, that the change takes place in the muscular tissue.

It is unfortunate that our cases could not be kept under observation longer, in order to observe the duration of the eosinophilia. The only two observations on this point that we have been able to discover are Brown's third case, where the blood was normal five months after the patient's discharge with an eosinophilia of 34.7 per cent., and Stump's case, where there was still an eosinophilia of 15 per cent. after four and one-half months.

As a result of the study of this outbreak we would conclude:

1. That in some epidemics of trichinosis one or more of the most characteristic symptoms may be lacking in the majority of the patients.
2. That in these cases the examination of the blood is of the greatest value, as pathognomonic changes are found in it, consisting in (a) an eosinophile leucocytosis, (b) a relative decrease in the neutrophiles, and (c) in many, but not all, cases a decrease in the small mononuclear leucocytes early in the disease.

THE RELATION OF MIGRAINE TO EPILEPSY.¹

WITH THE REPORT OF ILLUSTRATIVE CASES.

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THE relation of migraine to epilepsy is one of much interest, partly on account of the prevalence of both diseases. Two cases which have recently come under my observation seem of sufficient importance to be reported, and offer a modest contribution to our knowledge of the subject:

CASE I.—A. A. D., white, aged fifty-one years, a carpenter by trade, was referred to my clinic at the Polyclinic Hospital by Dr. S. Solis-Cohen, and to him I am indebted for the opportunity of studying the case.

Family History. Father died at the age of sixty-one years from "phthisis or spinal disease." Mother is living and well. One brother is living and well. The patient has had no children, but his wife had one miscarriage at the fourth month.

Previous History. The man had measles when a child, but his mother states positively that he had no convulsions in childhood. He denies having had venereal disease. He had "camp fever" in 1864, and was in bed for two weeks. He had some kidney trouble for two or three

¹ Read before the Philadelphia Neurological Society, October 23, 1899.